

Enrollment No: _____

Exam Seat No: _____

C.U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Electrical Machine-III

Subject Code: 4TE05EMC1

Branch: B.Tech (Electrical)

Semester : 5

Date : 25/11/2022

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
-

Q-1

Attempt the following questions:

(14)

- a) Hopkinson's test requires _____
 - a) One DC machine on which test is carried out
 - b) Two different DC machines
 - c) Two identical DC machines
 - d) Can be worked with one or two machines
- b) Which losses can be identified from Swinburne's test?
 - a) No-load core loss
 - b) Windage and friction loss
 - c) No-load and windage and friction loss
 - d) Stray load loss
- c) Swinburne's test can be carried out on all DC motors.
 - a) True
 - b) False
- d) What is the purpose of performing retardation test after Swinburne's test?
 - a) To find stray load loss
 - b) To find variable losses
 - c) To separate out windage and friction losses
 - d) To find shunt field losses
- e) The back to back test is best suited for
 - a) Large machines
 - b) Medium size machines
 - c) Small machines
 - d) All of these
- f) Retardation test on DC shunt motor is used for finding _____
 - a) stray losses
 - b) copper losses
 - c) friction losses
 - d) iron losses
- g) If the field current and armature current are reversed, then the _____



- a) direction of rotation remains same
- b) direction of rotation reverses
- c) stops
- d) none of the mentioned
- h)** The reactive power output of a synchronous generator is limited by _____
 - a) armature current and field current
 - b) field current and load angle
 - c) load angle and excitation
 - d) armature current only
- i)** In a synchronous motor, V-curves represent relation between
 - a) Armature current and field current
 - b) Power factor and speed
 - c) Field current and speed
 - d) Field current and power factor
- j)** A variable reluctance stepper motor is constructed of _____ material with salient poles.
 - a) Paramagnetic
 - b) Ferromagnetic
 - c) Diamagnetic
 - d) Non-magnetic
- k)** The rotor of a stepper motor has no
 - a) Windings
 - b) Commutator
 - c) Brushes
 - d) All of the mentioned
- l)** What is the angle between stator direct axis and quadrature axis?
 - a) 90°
 - b) 0°
 - c) 45°
 - d) 60°
- m)** State name of any two methods used to find voltage regulation of an alternator.
- n)** Why the windings of an alternator are short pitched?

Attempt any four questions from Q-2 to Q-8

- | | | |
|------------|---|-------------|
| Q-2 | Attempt all questions | (14) |
| | a) Explain Hopkinson test for dc machines. | (7) |
| | b) Briefly explain Swinburne's test for the testing of dc machine. | (7) |
| Q-3 | Attempt all questions | (14) |
| | a) Briefly explain field test on the dc machine. | (7) |
| | b) Explain brake test to find efficiency of dc machine. | (7) |
| Q-4 | Attempt all questions | (14) |
| | a) Derive the e.m.f equation of alternator. | (7) |
| | b) Compare synchronous motor with induction motor. | (7) |
| Q-5 | Attempt all questions | (14) |
| | a) State the important conditions for parallel operation of 3 phase alternator. | (7) |



b) Write and explain principle and construction of synchronous motor. (7)

Q-6 **Attempt all questions** **(14)**

a) Explain Armature reaction and its effects at lagging power factor in Alternator. (7)

b) Write short note on hunting on synchronous machines. (7)

Q-7 **Attempt all questions** **(14)**

a) Explain V-Curves of synchronous motor. (7)

b) Briefly explain working and applications of switch reluctance motor. (7)

Q-8 **Attempt all questions** **(14)**

a) Explain working and construction of stepper motor. (7)

b) Write short note on Boosters & Balancers. (7)

